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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,098	01/23/2004	Yoshihiro Akiyama	MM4667	8246

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EXAMINER

NGUYEN, SANG H

ART UNIT PAPER NUMBER

2877

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/764,098

Applicant(s)

AKIYAMA, YOSHIHIRO

Examiner

Sang Nguyen

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's response to amendment on 06/26/06 has been entered. It is noted that the application contains claims 1-6 and claim 7 has been canceled by the amendment on 06/26/06.

Response to Arguments

Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama et al (U.S. Patent No. 6,560,024) in view of Nakamura et al (U.S. Patent No. 5,880,828) and Nakamura et al (U.S. Patent No. 5,880,828).

Regarding claims 1 and 2; Akiyama et al discloses an appearance inspection apparatus for inspecting the appearance of a body comprising:

a scanning head (16 of figure 4) for scanning the body substrate (1 of figure 4) to be inspected; and

a main unit (12 of figure 4) for controlling the inspection apparatus considered to be a test unit (14 of figure 4) and said scanning head (16 of figure 4); wherein said scanning head (16 of figure 4) further comprises:

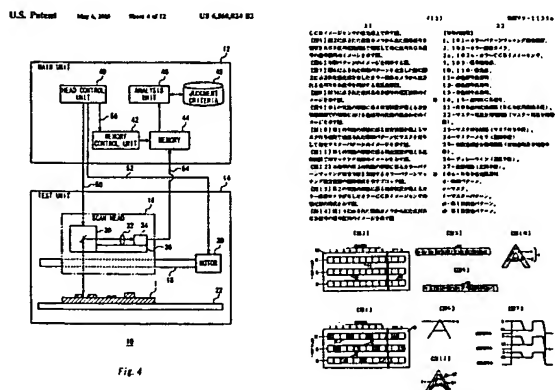
a lighting unit (30 of figures 4 and 6) having multiple light sources (100, 102 of figure 6) for projecting light onto a surface of said body (1 of figure 6) to be inspected; and

a one-dimensional sensor (34 of figure 4 and col.5 line 67 to col.6 line 2) for detecting light reflected (figure 4) from said surface of said body (1 of figure 4) to produce image data (figures 3A-3B); and wherein said main unit (12 of figure 2) further comprises:

a head control unit (40 of figure 4) for providing a control signal (50 of figure 4) to said lighting unit (30 of figure 4) for alternative switching between each of said multiple light sources (100, 102 of figure 6) to create different lighting states from the light projected by each of said lighting sources respectively (col.6 lines 12-26 and col.9 lines 24-30 and figures 15-16) and for controlling the relative motion of said scanning head (16 of figure 4) by a motor (20 of figure 4) relative to said body (1 of figure 4);

a memory control unit (42 of figure 4) for storing in memory image data (54 of figure 4) produced by said one-dimensional sensor (34 of figure 4); and

an analysis unit (46 of figure 4) for inspecting and reading the image to obtain an appearance inspection image of said body (1 of figure 4) to be inspected. See figures 1-16.



Akiyama et al discloses all of features of claimed invention except for the sensor comprises at least a plurality of arrays of multiple arrays of multiple image capturing elements corresponding to three (RGB) colors. However, Hanabusa et al teaches that it is known in the art to provide inspection of color pattern apparatus comprises a color CCD image sensor (2a of figure 1) for inspecting the object (8 of figure 1), wherein the sensor (2 of figure 1 or 10 of figure 2) comprises at least a plurality of arrays of multiple arrays (11, 12, 13 of figure 2) of multiple image capturing elements as three RGB colors (figures 2 and 4).

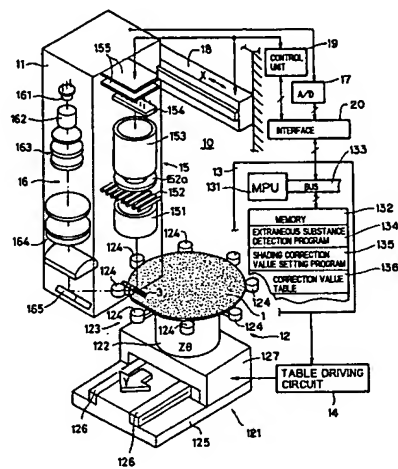
Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Akiyama et al's inspection apparatus with one dimension sensor comprises at least a plurality of arrays of multiple arrays of multiple image capturing elements corresponding to three (RGB) colors as taught by Hanabusa et al for the purpose of reducing the scale of installation space and reducing low cost.

Akiyama et al discloses all of features of claimed invention except for an analysis unit for correcting shading resulting from in said image data for each of the different lighting states switched by said head control unit to obtain an appearance inspection image of said body to be inspected. However, Nakamura et al teaches that it is known in the art to provide a inspection device and shading correction (figures 1-3) comprising an analysis unit (i.e., a data processing and control unit [13 of figure 1]) having a memory (132 of figure 1), a shading correction value setting program (135 of figure 1) and a correction value table (136 of figure 1) for correcting shading resulting from in

said image data for each of the different lighting states switched by said head control unit(i.e., a control unit [19 of figure 1]) to obtain an appearance inspection image of said body to be inspected.(col.4 line 5 to col.5 line 45 and col.6 line5 to 7 line 22). See figures 1-5.

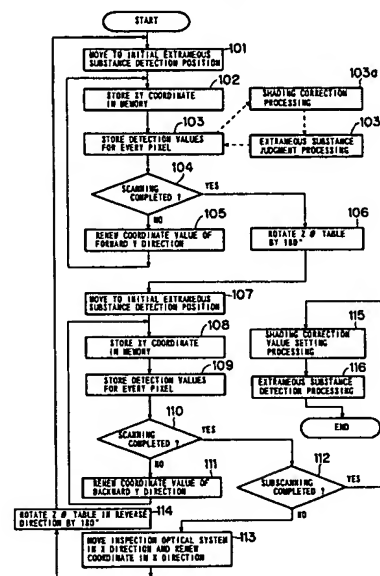
U.S. Patent Mar. 9, 1999 Sheet 1 of 5 5,880,828

FIG.1



U.S. Patent Mar. 9, 1999 Sheet 2 of 5 5,880,828

FIG.2



Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Akiyama et al's inspection apparatus with an analysis unit for correcting shading resulting from in said image data for each of the different lighting states switched by said head control unit to obtain an appearance inspection image of said body to be inspected as taught by Nakamura et al for the purpose of improving the image of the object by performing accurately shading correction for the CCD sensor arranged in the subscanning direction of device.

Regarding claim 3; Akiyama et al discloses said main unit (12 of figure 4) further comprises a correction value memory unit considered to be a judgment criteria (48 of figure 4 and col.6 lines 28-50) for storing digital correction values as a table for each array of image capturing elements of one dimension sensor (34 of figure 4). Akiyama et al teaches all of features of claimed invention except for each array of the RGB image. However, Hanabusa et al teaches that it is known in the art to provide inspection of color pattern apparatus comprises a color CCD image sensor (2a of figure 1) for inspecting the object (8 of figure 1) with multiple image capturing elements as three RGB colors (figures 2 and 4). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Akiyama et al's inspection apparatus with each array of RGB image as taught by Hanabusa et al for the purpose of reducing the scale of installation space and reducing low cost.

Regarding claim 4; Akiyama et al discloses all of features of claimed invention except for said correction values are utilized to correct shading corresponding to each lighting state of said lighting unit and wherein said analysis unit corrects shading of said image data with reference to said table kept in said correction value memory unit. However, Nakamura et al teaches that it is known in the art to provide a inspection device and shading correction (figures 1-3) comprising said correction values of table (136 of figure 1) are utilized to correct shading (135 of figure 1) corresponding to each lighting state of said lighting unit (16 of figure 1) and wherein said analysis unit (13 of figure 1) of correction shading (135 of figure 1) of said image data with reference to said table kept in said correction value memory unit (132 of figure 1). It would have been

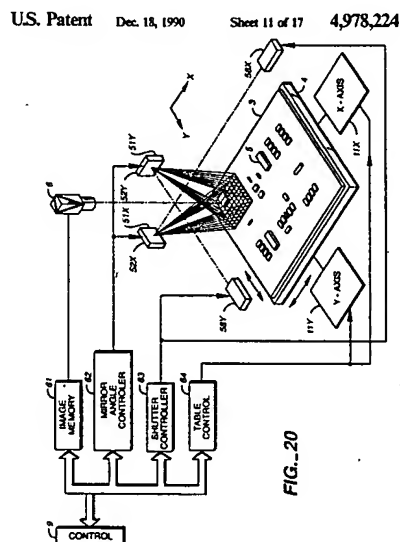
obvious to one having ordinary skill in the art at the time the invention was made to combine Akiyama et al's inspection apparatus with said correction values are utilized to correct shading corresponding to each lighting state of said lighting unit and wherein said analysis unit corrects shading of said image data with reference to said table kept in said correction value memory unit as taught by Nakamura et al for the purpose of improving the image of the object by performing accurately shading correction for the CCD sensor arranged in the subscanning direction of device.

Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama et al in view of Hanabusa et al and Nakamura et al as applied to claims 1-2 above, and further in view of Kishimoto et al (U.S. Patent No. 4,978,224).

Regarding claims 5-6; Akiyama et al in view of Hanabusa et al and Nakamura et al discloses said multiple light sources (100, 102 of figure 6) of said lighting unit (30 of figures 4 and 6) include: a side light source (102 of figure 6), which projects light onto the surface of said body (1 of figure 6) to be inspected at an angle (col.7 lines 5-10). Akiyama et al discloses all of features of claimed invention except for a slit light source, which projects a slit light at an angle, wherein said head control unit alternately switches said slit light source for lighting said surface. However, Kishimoto et al teaches that it is known in the art to provide apparatus for inspecting mounting of chip components on the substrate comprises a slit light source (51Y, 51X of figure 20) for projecting a slit light at an angle (figures 1 and 20) to a printed circuit board (3 of figure 20), wherein said head control unit considered to be controller (9 of figure 20) for alternately

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switching said slit light source (51Y, 51X of figure 20) for lighting said surface of the printed circuit board (3 of figure 20). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Akiyama et al's inspection apparatus with a slit light source, which projects a slit light at an angle, wherein said head control unit alternately switches said slit light source for lighting said surface as taught by Kishimoto et al for the purpose reducing the time required for determining end points and reducing the brightness to the surface.



Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schmidt et al (6552783) discloses optical system; Adler et al (6437312) discloses illumination for inspecting surfaces of articles;

Frefeld (6424735) discloses high precision three dimensional mapping camera;
or

Uemura et al (5197105) discloses method of reading optical image of inspected surface and image reading system.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Nguyen whose telephone number is (571) 272-2425. The examiner can normally be reached on 9:30 am to 7:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



August 3, 2006
Sang Nguyen
Patent Examiner



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